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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,415	03/29/2001	Mark Heimbaugh	3123-347	5595

32093 7590 07/09/2003

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EXAMINER

WONG, KIN C

ART UNIT	PAPER NUMBER
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2651

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/820,415

Applicant(s)

HEIMBAUGH, MARK

Examiner

K. Wong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings filed on 3/29/01 are acceptable for examination only.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims (1-27) are rejected under 35 U.S.C. 103(a) as being unpatentable over Stupeck et al (4786995) in view of Williams et al (5455496).

Regarding claim 1: Stupeck et al discloses an apparatus for retracting a disk drive actuator arm assembly (as depicted in figure 2 of Stupeck et al, including:

a spindle motor (element 22 in figure 2) which generates a back electromotive force voltage (as described in col. 6, lines 17-19 of Stupeck et al);

a DC-to-DC converter circuit (as depicted in figure 3 of Stupeck et al and in line with the instant specification on page 16, line 14 to col. 17, line 15 or the instant figure 8) of connected to the spindle motor which converts the back electromotive force voltage into an output voltage;

a feedback circuit connected to the DC-to-DC converter and controlling switching thereof (the noted functions are depicted in figure 3 – see col. 7, line 62 to col. 31 of Stupeck et al);

a retract circuit, connected to the DC-to-DC converter and powered thereby; and positioner motor activated by the retract circuit and operating to retract the actuator arm assembly (as describes in col. 6, line 60 to col. 7, line 8 of Stupeck et al).

Although Stupeck et al discloses a retraction circuit for the head positioner motor, Stupeck et al fails to mention the positioner motor as a voice coil motor (VCM). Williams et al is relied on for the teachings of a positioner motor as a VCM (see col. 6, line 51 to col. 7, line 16 of Williams et al).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify or substitute the positioner motor with a VCM as taught by Williams et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to provide a motor that use less power as suggested in col. 8, lines 38-42 of Williams et al.

Regarding claim 2: Stupeck et al depicts in figure 3 that wherein the DC-to-DC converter includes an inductor, a switch, a diode, and a capacitor (see col. 7, line 9 to col. 8, line 31 of Stupeck et al for details).

Regarding claim 3: Stupeck et al depicts the elements (96, 98 and 100) in figure 3 that wherein windings of the spindle motor are used as the inductor.

Regarding claim 4: the limitations of wherein the output voltage is larger than the back electromotive force voltage are considered known because Stupeck et al describes the control for controlling the conversion which control the amount of the output voltage of the converter in respective the input (back-emf), i.e. the output charge power will be larger than the input (or back-emf).

Regarding claim 5: Stupeck et al depicts in figure 3 that wherein the retract circuit is connected to an output portion of the DC-to-DC converter and is powered by the output voltage.

Regarding claim 6: the limitations of wherein the feedback circuit includes comparison circuitry for comparing the output voltage of the DC-to-DC converter to a predefined target voltage.

Regarding claim 7: the limitations of wherein the feedback circuit opens the switch based upon a comparison of the output voltage to the predefined target voltage.

Regarding claim 8: Stupeck et al teaches that wherein said feedback circuit further includes timing circuitry (in col. 7, lines 9-61 of Stupeck et al wherein Stupeck et al describes the timing control and the timing circuitry).

Regarding claim 9: Stupeck et al teaches that wherein the timing circuitry has a fixed off period timer wherein the switch is closed following the fixed off-period (in col. 7, lines 24-34 of Stupeck et al).

Regarding claim 10: the limitations of wherein the feedback circuit includes low voltage limit circuitry, wherein the switch is closed permanently based upon the output voltage level following the fixed off-period are considered known because Stupeck et al describes in col. 7, lines 35-61 the timing control of the feedback control of the power generation in the spindle motor.

Regarding claim 11: Stupeck et al teaches that wherein the timing circuitry has a variable off-period timer wherein the switch is closed following the variable off-period (in

col. 7, line 35 to col. 8, line 31 of Stupeck et al where Stupeck et al describes the variable timing control of the feedback loop to the spindle motor).

Regarding claim 12: Stupeck et al teaches that wherein the variable off-period is adjusted dependent upon the output voltage of the DC-to-DC converter during the variable off-period (in col. 7, line 63 to col. 8, line 26 of Stupeck et al).

Regarding claim 13: Stupeck et al teaches that wherein the timing circuitry has a variable on-period timer wherein the switch is closed during the variable on-period (in col. 7, line 35 to col. 8, line 26 of Stupeck et al).

Regarding claim 14: Stupeck et al teaches that wherein the variable on-period is adjusted dependent upon the output voltage of the DC-to-DC converter during the variable on-period (in col. 7, line 35 to col. 8, line 26 of Stupeck et al).

Regarding claim 15: Stupeck et al teaches that wherein the timing circuitry has a maximum value for the variable off-period (in col. 7, lines 35-46 of Stupeck et al).

Regarding claim 16: Stupeck et al teaches that wherein the variable off-period is adjusted based upon the output voltage of the DC-to-DC converter during the variable off-period (in col. 7, line 7, line 63 to col. 8, line 26).

Regarding claim 17: Stupeck et al teaches that wherein the switch is closed permanently upon the variable off-period reaching the maximum value (in col. 7, lines 35-46 of Stupeck et al).

Regarding claims 18-25: method claims (18-25) are drawn to the method of using the corresponding apparatus claimed in claims (1-17). Therefore method claims (18-25)

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correspond to apparatus claims (1-17) and are rejected for the same reasons of obviousness as used above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims (26-27) are rejected under 35 U.S.C. 102(b) as being anticipated by Stupeck et al (4786995).

Regarding claim 26: Stupeck et al discloses an apparatus for retracting a disk drive actuator arm assembly (see col. 8, lines 54-68 of Stupeck et al), including:

a retract means (as depicted in figure 3 of Stupeck et al) for retracting the disk drive actuator arm assembly;

a motor means (element 22 in figure 2 of Stupeck et al) for generating a back electromotive force voltage (see col. 6, lines 12-19 of Stupeck et al);

a converter means (as depicted in figure 3 of Stupeck et al) for converting the back electromotive force voltage into an output voltage for powering the retract means (see col. 7, line 62 to col. 8, line 31 of Stupeck et al and the discussion in claim 1); and

a feedback means for controlling the converter means (as depicted in figure 3 and see the associated description for details).

Regarding claim 27: Stupeck et al teaches that wherein the feedback means includes: a comparison means for comparing the output voltage to a predefined target voltage (or the representation of the target); a switch means for switching the converter means; and a timer means for timing the switch means (in col. 7, line 9 to col. 8, line 31 of Stupeck et al).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hanson et al (4831469), Wever et al (4679102), Albrecht (6025968), Hussein et al (6181502), Klaassen et al (6560057) and Bennett et al (6574062) are cited for retraction control with power management.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Wong whose telephone number is (703) 305-7772.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Hudspeth can be reached on (703) 308-4825. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for all communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

0-kw

28 Jun 03



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